

U.S. Patent Application Serial No. 09/814,183
Amendment dated December 4, 2003
Reply to OA of April 2, 2003

AMENDMENTS TO THE SPECIFICATION:

Amend the specification as follows:

Replace the paragraph beginning on page 2, line 5, with the following rewritten paragraph:

B2
In assembling of the traveling caterpillar, the first bush 61 disposed between the connecting portions 57,57 of the oppositely disposed links 52a, 52b, second each end of the bush 61 is inserted into the bush inserting bore [[69]] 59 of each side, with the pin 60 having been inserted into the bush 61. Opposite end portions of the pin 60 that are protruded from the bush 61 are inserted into inserting bores 58 of the other links 52a and 52b to be connected, thereafter links 52a or 52b (general symbol: 52) are firmly connected with the pin 60 by means of fixing structure 62 shown in FIG. 13.

Replace the paragraph beginning on page 3, line 21, with the following rewritten paragraph:

B3
The fixing structure, according to ~~Claim 1~~ the principles of the present invention, for connecting a pin with a link in a caterpillar is characterized in that, a pin 2 is fitted into a pin inserting bore 7 formed in the link 1, wherein on the end portion of the pin 2, a peripherally extending concave groove 18 is formed so that an annular space 16 is formed between the

B3 opening-periphery of the pin inserting bore 7 and the peripherally extending concave groove 18, and into this peripherally extending concave groove 18, an escape-preventing ring 17 for limiting escaping relative motion of the pin 2 toward the off-opening side is fitted, further the hardness of the pin 2 at the bottom surface of the groove 18 is lowered than that of the pin 2 at the portion with which the link 1 is connected.

[Replace the paragraph beginning on page 4, line 10, with the following rewritten paragraph:

B4 The fixing structure, according to ~~Claim 1~~ the principles of the present invention, for connecting the pin with the link in the caterpillar has some advantages as follows. The escape-preventing ring 17 fitted into the annular space 16 can effectively prevent escaping of the pin 2 from the link 1, allowing the stable connection between the link 1 and the pin 2. In the event that the escape-preventing ring 17 exerts around the bottom surface of the peripherally extending groove 18 when the ring 17 is fitted into the groove 18, brittle fracturing on the bottom surface of the groove 18 can be prevented because of lowered hardness of the bottom surface of the groove 18. Accordingly, by applying the fixing structure of this invention to assembling of a caterpillar wherein the pin 2 is connected with the link 1, vehicles provided with the caterpillar can maintain stable reliability for a long period, here, the vehicle means heavy equipment, such as, for example, bulldozers, hydraulically operated shovels, and the like.

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[Replace the paragraph beginning on page 5, line 1, with the following rewritten paragraph:

B3 The fixing structure, according to ~~Claim 2~~ the principles of the present invention, for connecting the pin with the link in the caterpillar, is characterized in that the hardness at the bottom surface of the peripherally extending groove 18 around the pin 2 is lowered by means of annealing process.

[Replace the paragraph beginning on page 5, line 6, with the following rewritten paragraph:

B6 Accordingly, by use of the fixing structure, according to ~~Claim 2~~ the principles of the present invention, for connecting the pin with the link in the caterpillar according to ~~Claim 2~~ the principles of the present invention, the hardness at the bottom surface of the groove 18 around the pin 2 can be easily lowered, productivity can be enhanced, and brittle fracturing is effectively prevented.

[Replace the paragraph beginning on page 5, line 11, with the following rewritten paragraph:

B7 The fixing structure, according to ~~Claim 3~~ the principles of the present invention, for connecting the pin with the link in the caterpillar, is characterized in that the hardness at the bottom surface of the peripherally extending groove 18 around the pin 2 should preferably be

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b7
maintained from 30 to 45 as measured by H_RC scale, while the surface hardness at the portion of the pin 2 with which the link is connected should preferably be maintained from 50 to 65 as measured by H_RC scale.

[Replace the paragraph beginning on page 5, line 19, with the following rewritten paragraph:

b8
Accordingly, by use of the securing structure, according to ~~Claim 3~~ the principles of the present invention, for connecting the pin with the link in the caterpillar according to ~~Claim 3~~ the principles of the present invention, the pin 2 is strengthened as a whole, thereby stabilizing the caterpillar using the fixing structure of this invention.

[Replace the paragraph beginning on page 5, line 24, with the following rewritten paragraph:

b9
In the fixing structure, according to ~~Claims 1 through 3~~ the principles of the present invention, for connecting the pin with the link in the caterpillar as an optional matter, the peripherally extending groove 18 is provided at its bottom surface with a ring guiding ramp surface or tapered surface 20 which guides the above mentioned escape-preventing ring 17 inwardly from outward along the longitudinal direction of the ring 17.

[Replace the paragraph beginning on page 6, line 6, with the following rewritten paragraph:

B10 By use of the fixing structure, according to ~~Claims 1 through 3~~ the principles of the present invention, for connecting the pin with the link in the caterpillar, the escape-preventing ring 17 is guided by the guiding ramp 20 when the escape-preventing ring 17 is fitted into the annular space 16, allowing simple and reliable operation in engagement of the ring 17.

[Replace the paragraph beginning on page 6, line 12, with the following rewritten paragraph:

B11 Further, in the fixing structure, according to ~~Claims 1 through 3~~ the principles of the present invention, for connecting the pin with the link in the caterpillar, the following structure is optionally adaptable. The link 1 has a tapered surface 19 around the opening-periphery of the pin-inserting bore 7, the tapered surface being narrowed (decreased in diameter) inwardly along longitudinal direction, while pin 2 has a ring guiding tapered surface 20, and then that virtually extended surfaces of the tapered surfaces 19 and 20 are designed to acutely intersect together. Into an annular space 16 defined by the surface 19 and 20, the escape-preventing ring 17 is pressed, so that frictional force is generated by compression force due to press-fitting of the escape-preventing ring 17. By such frictional force, such state that the escape-preventing ring 17 is hardly allowed to come out from the annular groove 16, so to say, self-supporting wedging state is established.